Pilot Exposure Investigation:

Dioxin Exposure in Adults Living in the Tittabawassee River Flood Plain, Saginaw County, Michigan

Michigan Department of Community Health

MDCH

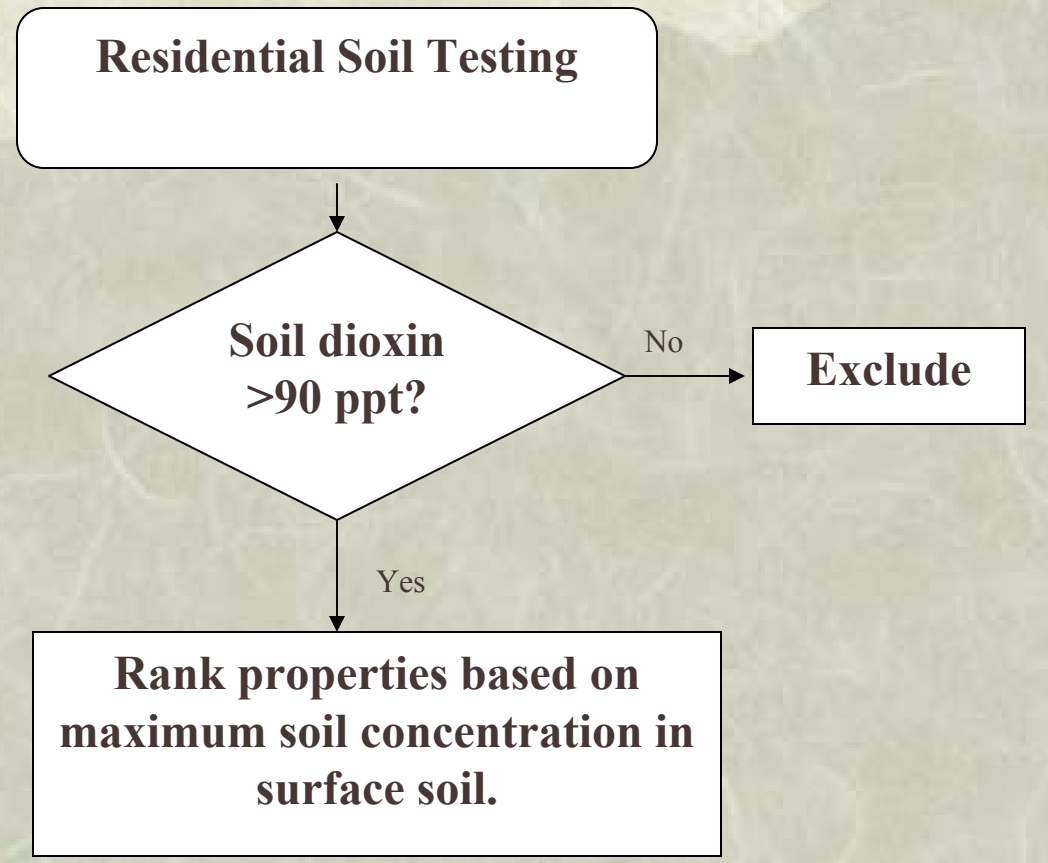
Purpose of the PEI:

- to provide information on the levels of dioxins in soil, indoor dust, and blood samples for 25 adult residents of the Tittabawassee River flood plain.

- to provide information about how to conduct a larger exposure investigation that could include several hundred people from the city of Midland, the Tittabawassee River flood plain, and a comparison community.

Soil Sampling

July to December 2003



Property Selection

- Properties where dioxin TEQs in all surface soil samples are less than 90 ppt will be excluded

- Properties where dioxin TEQs in surface soil are greater than 90 ppt will be scored based on soil concentration and area of contamination.

- Soil Concentration
  - ranked highest to lowest,
  - divided into quartiles,
  - and assigned a score of 1 to 4,
    where 4 = higher concentrations.

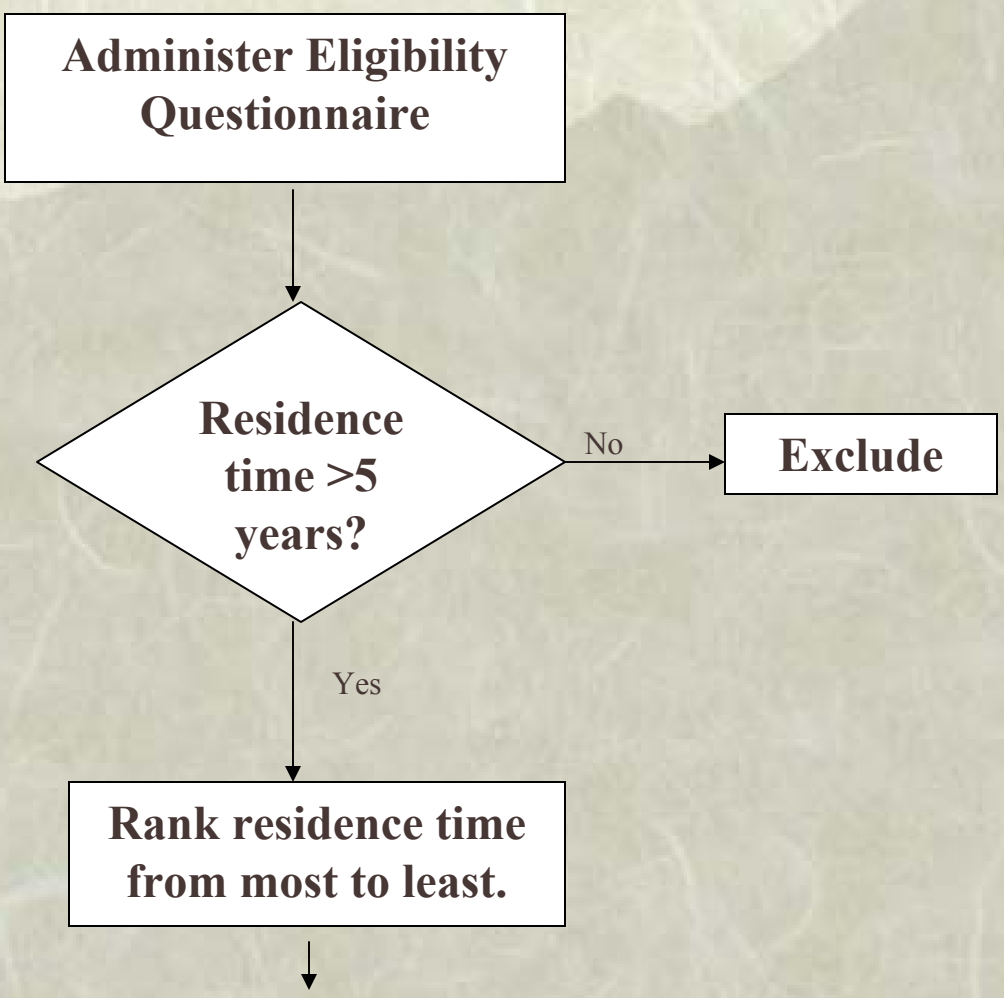
- Area of contamination
  - > 90 ppt on the entire property = 3
  - > 90 ppt only near the house = 2
  - > 90 ppt not near the house = 1

Soil Contamination

+ Area of Contamination

= Property Score

Participant Selection



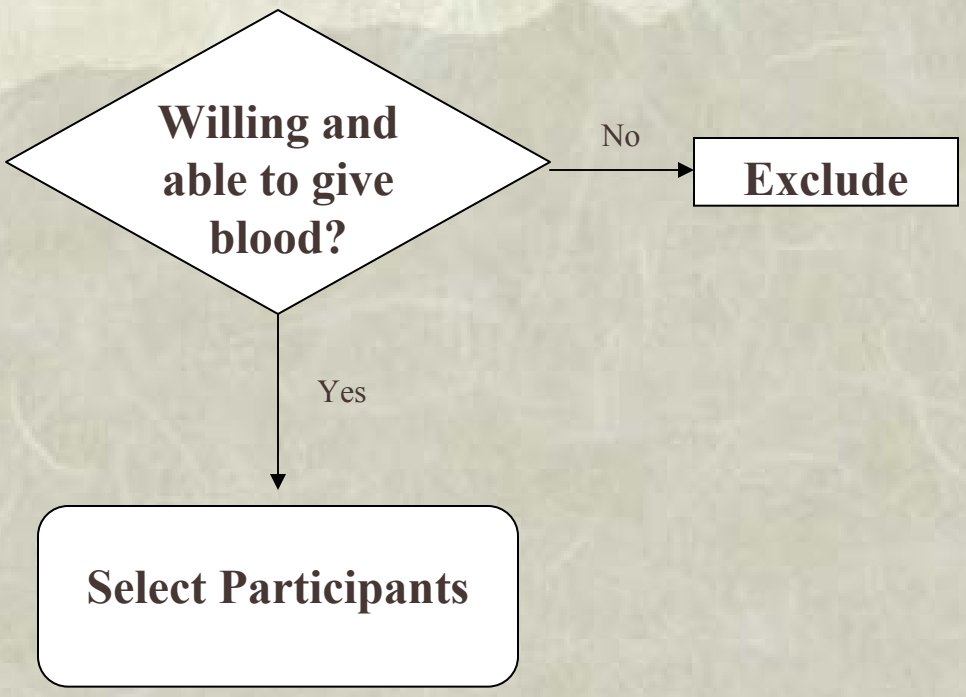
Residence Score

Residence time is

- ranked from highest to least,
- divided into quartiles
- assigned a residence score of 1 to 4,

  where 4 = the longest residence times

Participant Selection cont.



Property Score

+ Resident Score

= Participant Score

Next Steps

- January to June 2004
  - Blood Sampling
  - Interview questionnaire
  - Indoor dust sampling
- June to end of 2004
  - Inform participants of their results in writing
  - Develop Investigation Report

PEI Limitations

- PEI findings are not generalizable to the larger population in the flood plain.
- PEI cannot determine the origin of dioxins detected in soil, dust, or blood.
- PEI cannot quantify the contribution of each exposure pathway to the levels of dioxins in blood.
- PEI cannot determine if people will have health effects as a result of the level of dioxins found in their blood.

The PEI can tell us……

- …whether soil concentrations on sampled properties are greater than MDEQ criteria,
- …whether indoor dust in sampled homes contains dioxins,
- …whether the blood of the 25 people who participate in the PEI contains dioxins at levels different than people from other parts of the country.

The PEI can tell us……

- …if there are problems with the protocol sampling methods or interview questionnaire,

- …if we need to make changes before implementing a much larger…and more expensive…Exposure Investigation in the flood plain and the city of Midland.